

Answers to Worksheet 28 - Derivatives Review

$$1) \frac{dy}{dx} = 3(-x^5 - 3)^2 \cdot -5x^4 \\ = -15x^4(-x^5 - 3)^2$$

$$2) \frac{dy}{dx} = -5(-3x^4 + 4)^{-6} \cdot -12x^3 \\ = \frac{60x^3}{(-3x^4 + 4)^6}$$

$$3) \frac{dy}{dx} = \frac{1}{2}(2x^3 + 3)^{-\frac{1}{2}} \cdot 6x^2 \\ = \frac{3x^2}{(2x^3 + 3)^{\frac{1}{2}}}$$

$$4) \frac{dy}{dx} = \frac{1-y}{5+x}$$

$$5) \frac{dy}{dx} = \frac{9x^2 - 10xy^2}{10x^2y + 3}$$

$$6) \frac{dy}{dx} = \frac{1}{3x^3} \cdot 9x^2 \\ = \frac{3}{x}$$

$$7) \frac{dy}{dx} = \frac{1}{5x^5} \cdot 25x^4 \\ = \frac{5}{x}$$

$$8) \frac{dy}{dx} = e^{2x^3} \cdot 6x^2$$

$$9) \frac{dy}{dx} = -\frac{1}{x^2} - \frac{8}{5x^3} + \frac{6}{x^5}$$

$$10) \frac{dy}{dx} = \frac{x}{2} + \frac{1}{2x^2} + \frac{4}{5x^3}$$

$$11) \frac{dy}{dx} = \left(-3x^{\frac{3}{5}} + 3\right) \cdot 10x + (5x^2 - 2) \cdot -\frac{9}{5}x^{-\frac{2}{5}}$$

$$12) \frac{dy}{dx} = \left(x^{\frac{2}{5}} - 2\right) \cdot 12x^2 + (4x^3 - 1) \cdot \frac{2}{5}x^{-\frac{3}{5}}$$

$$13) \frac{dy}{dx} = \frac{\left(3x^{\frac{1}{5}} + 5\right)(6x^2 + 8x) - (2x^3 + 4x^2) \cdot \frac{3}{5}x^{-\frac{4}{5}}}{\left(3x^{\frac{1}{5}} + 5\right)^2}$$

$$14) \frac{dy}{dx} = \frac{\left(3x^{\frac{2}{5}} + 5\right) \cdot 20x^4 - (4x^5 - 4) \cdot \frac{6}{5}x^{-\frac{3}{5}}}{\left(3x^{\frac{2}{5}} + 5\right)^2}$$

$$15) \frac{dy}{dx} = \tan 4x^5 \cdot 4x^3 + (x^4 + 1) \cdot \sec^2 4x^5 \cdot 20x^4$$

$$16) \frac{dy}{dx} = -\sin 2x^5 \cdot 10x^4 \\ = -10x^4 \sin 2x^5$$

$$17) \frac{dy}{dx} = \frac{(3x^4 - 2)\cos 2x^5 \cdot 10x^4 - \sin 2x^5 \cdot 12x^3}{(3x^4 - 2)^2}$$